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An investigation of the possible existence of an effect of the service tenure upon personality characteristics as measured by the Structured-Objective Rorschach Test (SORT).

Rushing, Charles F.

Monterey, California: U.S. Naval Postgraduate School

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AN INVESTIGATION OF THE POSSIBLE EXISTENCE OF AN EFFECT OF SERVICE TENURE UPON PERSONALITY CHARACTERISTICS AS MEASURED BY THE STRUCTURED-OBJECTIVE RORSCHACH TEST (SORT)

CHARLES F. RUSHING

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* * * * *

Charles F. Rushing

AN INVESTIGATION OF THE POSSIBLE EXISTENCE OF AN EFFECT OF SERVICE TENURE UPON PERSONALITY CHARACTERISTICS AS MEASURED BY THE STRUCTURED-OBJECTIVE RORSCHACH TEST (SORT)

by

Charles F. Rushing

Lieutenant Commander, United States Navy

Submitted in partial fulfillment of
the requirements for the degree of

MASTER OF SCIENCE
IN
MANAGEMENT

United States Naval Postgraduate School
Monterey, California

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by

Charles F. Rushing

This work is accepted as fulfilling
the research paper requirements for the degree of
MASTER OF SCIENCE
IN
MANAGEMENT
from the
United States Naval Postgraduate School

ABSTRACT

Structured-Objective Rorschach Test (SORT) scores of 218 United States Naval Postgraduate School students were subjected to a multiple regression analysis to determine if there is an effect of service tenure upon personality characteristics. The results obtained indicate that SORT scores, which are a measure of personality characteristics, are probably random in respect to service tenure and age.

The study includes a review of the history of group Rorschach methods, civilian and military, and evaluates the possible future use of the SORT in the Navy. It concluded that the value of the SORT for military group comparisons is undetermined, and that further use of the test at the Naval Postgraduate School is necessary in order that its value definitely may be established.

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CHAPTER I

STATEMENT OF THE PROBLEM

Since 1921, when Dr. Hermann Rorschach introduced his first model of the projective psychological test, the "ink-blot" technique of personality interpretation has become one of the most valuable tools in the fields of Psychology, Sociology, Psychiatry, and Anthropology. Behavioral scientists have developed, in the past forty years, many types of personality tests for use in the clinic as well as in education and industry. While no one test can stand alone as a panacea in the search for a yardstick of trait characteristics, the Rorschach technique remains pre-eminent.

Over the years, several variations of the original Rorschach methods have evolved, the characteristics of each being dependent upon its intended use. One of these, the "Structured-Objective Rorschach Test" (SORT), was developed by the California Test Bureau for use in education and industry as an aid in vocational guidance and personnel selection.

The military services are now making relatively little use of Rorschach methods. This study will analyse the SORT scores of 218 Naval Postgraduate School students and, through regression and discriminant analysis, relate the results to possible further utilization of the SORT in the naval service.

THE PROBLEM

This research study was undertaken to investigate the possible existence of an effect of service tenure upon personality characteristics as measured by the SORT. Do organizational stresses and environmental conditions within the Navy operate to

shift personality differences among naval personnel? If so, are these shifts proportional to individual length of service?

SOCIAL PURPOSE

A study of this nature might benefit the Navy, the other military services and, perhaps, industry in the following ways:

1. It would add to the store of knowledge of group personality characteristics, thereby:

   a. permitting a further degree of comparison of an individual with his contemporaries as an aid in the evaluation of his performance, and

   b. aiding in the assignment of personnel to differentiated groups, as an adjunct to other tests and criteria.

2. It might reveal the effects of organizational stresses upon group personality characteristics. Identifiable features of the organization might then be changed to offset undesirable trends.

3. Information obtained in a study of this type might be useful in other highly structured organizations, such as in industry.

4. If it is determined by this and further studies that personality characteristics are consistent over time, pre-enlistment/pre-commissioning personality assessment tests would bear closer relationships to subsequent performance.

DEFINITIONS OF KEY TERMS

Personality: ... the progressive final integration of all the systems of response that represent an individual's adjustment to his various environments.

-- Gordon W. Allport (1, p.349)

Service Tenure: The number of years an individual has served on active duty in the military. For this study, service tenure has been computed to the nearest six months as of the date of the test.

Enlisted Service, Commissioned Service, Longevity: The three categories of service tenure as used in this study, the latter being the sum of the other two.

Regression Analysis: Yamane (18, p.368, p.640) defines simple linear regression analysis as the computation of a relation between two variables that are related causally. "Multiple" linear regression analysis, which is used in this study, calculates the relation among one dependent variable and two or more independent variables. Here, we handle three separate measures of service tenure (individually) as dependent variables, and measure the interrelationships of as many as 25 independent variables (SORT scores).

Discriminant Analysis: A means of calculating a best index for discrimination between two or more groups. (17, BIMD 05, p.1)

Structured-Objective Rorschach Test (SORT): A forced response paper-and-pencil projective ink-blot personality test designed to appraise vocationally significant personality traits. (14)

SORT Variables: The 15 stimulus-responses to the characteristics of ink-blots which the subject may make. See the Appendix for a complete description. They will be referred to in this study by their symbols, i.e.: W, D, Dd, Fch, etc.

SORT T-Scores: A measure of the subject's responses to the various characteristics of the ink-blots. T-Scores are normalized standard scores having arithmetic means equal to 50 and standard

deviations equal to 10. Relationships between T-Scores are interpreted as having similar magnitude of differences all along the scales. This stability of comparison is the specific virtue accounting for the use of T-Scores in the SORT, making it possible to convert T-Scores to ratings as follows: (14, p.13)

TABLE 1

TABLE FOR CONVERTING T-SCORES TO RATINGS

T-Scores	Ratings	Expected Per Cent of Cases
66-80	High	7%
55-65	Above Average	23%
45-55	Average	40%
35-44	Below Average	23%
20-34	Low	7%

Percentages based on Normative Population of SORT which consisted of over 8000 adults drawn from diverse occupations. (14, p.4-10)

SORT Attributes: The personality "factors" (25 of which are used in this study) derived from interpretation of the SORT Variables. In the case of the SORT, interpretation of attributes relies on basic Rorschach interpretation, which assumes a relationship between the kinds of responses to the stimulus-blots and "behavior domains" (Attributes). (14, p.7-8) A complete description of the Attributes may be found in the Appendix.

SORT Attribute Scores: Derived from the T-Scores through the relationships implied by the definitions of the Attributes. Formulae are included with the Attribute definitions in the Appendix. It should be noted that a constant, 60, was added to all formulae which result in ranges from -60 to +60, changing the ranges to 0-120. This would facilitate plotting and also render input data acceptable to certain BIMD programs.

Program BIMD 34: One of the BIMD (Biomedical) Series of computer programs, prepared in the Division of Biostatistics, University of California at Los Angeles, with support in part from the National Institutes of Health, U. S. Public Health Service. Available in the USNPGS Computer Facility Library, the programs are written in FORTRAN language and, in this case, were used with the CDC 1604 Computer. The BIMD 34 program calculates multiple regression in a stepwise manner, i.e., at each step an independent variable is added to the regression equation which makes the greatest improvement in "goodness of fit". (17)

Program BIMD 05: This program computes a linear function of n variables measured on each individual of two groups which in a certain sense serves as a best index for discrimination between the groups, e.g., "discriminant analysis". (17)

Correlation Coefficient: A measure of the degree of relationship between two or more variables or, in other words, the degree to which variables or measures vary together. Mathematically, the value may range from a perfect positive correlation (+1.0) through no relationship (0.0) to a perfect negative correlation (-1.0). When correlating variables, the coefficients indicate roughly the following strengths of relationships between the variables: (7, p.219)

Less than .20 ...Slight, almost negligible relation.

.20-.40 .....Low correlation, definite but slight relationship.

.40-.70 .....Moderate correlation, substantial relationship.

.70-.90 .....High correlation, marked relationship.

.90-1.0 .....Very high correlation, very dependable relationship.

> Those who employ tests in guidance and selection consider that a correlation coefficient should be at least .45 for material usefulness and that best results are obtained when the coefficient is above .60.

Level of Significance: The maximum probability with which we would be willing to risk a Type I error (rejection of an hypothesis which should be accepted). Or, conversely, with a significance level of .01, we are 99% confident that we have made the right decision. (15, p.168) Desired significance level for this study is .05.

F-Statistic: A factor which indicates the degree of variance between two groups, such degree of variance being dependent upon the relationship between that factor and the "degrees of freedom" which exist. (18, p.610)

Degrees of Freedom: The number of elements that can be chosen freely; or, the number of variables that can vary freely; or, the number of independent variables. (18, p.474)

ASSUMPTIONS

1. It is theoretically possible to separate the effects of age (developmental differences) and service tenure (organizational effect differences), although the two are interdependent and often intuitively inseparable.

2. The validity of standard statistical methods as utilized in the BIMD Series is assumed.

3. Service in the U. S. Coast Guard would expose a personality to the same organizational stresses as would service in the U. S. Navy.

LIMITATIONS

The performance of this study and the interpretation and use of its results are subject to the following limitations:

1. The number of subjects (observations) was limited by the number of completed SORT tests available at the time of this study. Results from this year's tests were immediately available, while SORT scores from last year's Management group were obtained from the Dreese-Russell study (5, p.43-52).

2. Since almost half of the subjects were from last year's group and not located in the area, the only personal information available on all subjects is that which is found in the Navy Register (3) and the Coast Guard Register (16). Access to general service performance records (i.e., fitness reports, etc.) is not attainable.

3. It is possible that the sample of 218 subjects is too small to give dependable results. Further, since it was necessary to "mix" aviators with Supply Corps officers, etc., there may be differences in sub-group norms which counteract with one another and spoil correlation of the variables.

4. Before the results of this study can be applied to the naval service as a whole, it should be recognized that this subject group is not truly representative of an "average" group of naval officers. With few exceptions, subjects are all "successes" in their fields, and it is presumed that each was picked to attend the Postgraduate School on the basis of promising potential. Not all naval officers on active duty possess the same level of potential as does this group.

5. Mary D. Ainsworth and Bruno Klopfer warn that:

> ... to fill the "flesh" of the personality in a meaningful way it is highly desirable to consider the Rorschach findings in the context of findings from other psychological tests and case history information. (9, Vol.I, p.251-252)

6. The Literature is replete with reminders that the test situation itself can influence Rorschach scores to a marked degree. Gibbey, Kimble, and Lord, in three separate experiments (9, Vol.I, p.457-459), successfully determined (in the order cited) that:

a. The Rorschach technique is not wholly resistent to deliberate efforts on the part of the subject to change his pattern of response, particularly in the case of normal, flexible subjects.

b. The standard Rorschach Test, when taken in a "social" situation, produced strikingly different results than when taken individually.

c. The change in "atmosphere" produced by changing the examiner resulted in different responses by the same individuals in a test-retest situation.

This test was taken by the several sub-groups at different times and proctored by several different examiners. Although the SORT is relatively insusceptible to effects of the test situation (14, p.16), degree of influence cannot be determined since test-retest checking of the results were not conducted.

7. Joics B. Stone (14, p.16-17) offers the following cautions in the use of SORT results:

a. The visual acuity of the subject could have an effect on the SORT score, but such an effect has not been

documented in the hostory of the SORT. Neither has this possible effect been considered in this study: it has been assumed that poor vision was, in each case, corrected with glasses. (This is required of active-duty naval officers).

b. Interpretations of temperament must be conditional. The inherent dynamic emotional structure of an individual may fluxuate from time to time. This study did not utilize test-retest methods to isolate this factor.

c. SORT data indicates "tendencies" and not "skills". (See the Appendix for a complete description of SORT Attributes.)

8. Personality traits are interrelated one to another and each individual trait score should not be perceived out of context with the overall score profile.

9. In view of the General Telephone Study, the Brigham Young University Study, and certain Interoccupational Comparisons, all described in the SORT Manual (14, p.6-7) as successful tests of the concurrent validity of SORT, it is considered that the SORT is a valid and reliable test. The validity and reliability of the particular tests taken in this study, however, cannot be checked directly since a study of this exact nature has never been attempted before with the SORT, and naval officer group norms are not available. Comparison of the SORT correlation matrix with this study's matrix is discussed in the Procedures section.

RESEARCH SIGNIFICANCE

Use of the Rorschach technique in the military since the Korean Conflict has been limited. A search of Department of Defense Documentation Center files reveals only a few examples

now on record, although Holtzman (8, p.4) and Molish (11) describe an upsurge in the use of Rorschach methods as a pre-selection device during World War II.

The Molish paper, published in 1956, concerns itself only with the Rorschach test as used in the military in a prognostic, rather than a diagnostic role. Molish, a PhD and Navy Medical Service Corps officer, pointed out that the Rorschach was used in many variations from standard procedures. One of the tests developed for the services which bore a close relationship to traditional methods, however, was the Multiple Choice Rorschach (MCR). Dr. Molish describes the use of this test in large military groups for the purpose of predicting future performance. Procedures for this test included an individual inquiry conducted with each subject by a skilled Rorschach worker. (The MCR, then, is relatively unstructured, when compared with the SORT.) Molish concluded that the use of large scale Rorschach techniques as applied to the problems of selection and screening of large military populations is not too encouraging since "... It would appear that even when applied to normal superior adults, any interpretation of Rorschach scores must be made within the framework of the norms for that subpopulation to which the subject belongs." (11, p.813) In his summary, Molish generalized his review of military use of Rorschach to date (1956) as being of "limited adequacy". (11, p.815)

An abstract of a study by Fokkema, conducted in Europe, describes an unsuccessful attempt to construct a foolproof quantitative Rorschach score for selection purposes in aviation psychology. The author concluded that construction of such a score was not yet possible. (6)

Dreese and Russell (5) used the SORT, together with several other tests, to determine predictors of academic performance in the Management Curriculum at the Navy Postgraduate School. They concluded that SORT, by itself, was not a useful predictor.

After a thorough review of Rorschach research up to this time, although many group studies using military personnel have been made, it appears that no study for the purpose specified herein has ever been accomplished.

It would seem appropriate at this point to reiterate the goal of this study in order that a parallel may be drawn with other research in the field of group comparison techniques. Regression analyses will be performed to determine if there is a correlation among service tenure (and age) on one side of the coin and personality factors (SORT Variables or SORT Attributes) on the other. If high correlations do exist, the results would serve to either confirm or delimit popular intuitive beliefs about naval officers such as: Senior officers are more rigid than junior officers; junior officers tend to pay more attention to detail than senior officers; the longer you stay in the service, the more you conform; etc. It would also seem possible, given a SORT Variable matrix loaded with high correlation coefficients, to take an individual's SORT Variable scores and say, "There is a high probability that this officer is about 34 years old, has been commissioned for ten years, and began his service as an enlisted man for several years before entering the Naval Academy." We could also take his Attribute scores and compare his personality profile with that of his contemporaries' group

norms and determine, for instance, whether or not he is "more rigid" or "more structured" than the average officer in his category.

It is in the latter area that this project differs from other studies in the field of group comparison. According to Klopfer, et. al. (9, Vol.I, p.465-469):

> Usually such group comparisons limit themselves to statistical treatment of the various scoring categories and quantitative proportions and omit considerations of qualitative differences.

For example, the SORT Manual (14), in its tabulations of group norms, limits the comparisons to the differences in SORT Variable scores: the SORT Attributes (qualitative scores) are not used in group comparisons but only in analysing the individual.

Quantitative analysis of the SORT Variables is made a part of this study, but only for checking the results of qualitative analysis of the Attributes. Klopfer would argue that this is "skating on thin ice", so to speak:

> ... it is rare that a group comparison is sufficiently crucial to lend strong positive support to the claim for validity of any given hypothesis, but rather support is to be found in the general congruency of the Rorschach findings with "common sense" of theoretical understanding of the differential character of groups. ... Thus, group comparisons are a means of detecting grossly invalid hypotheses, and sometimes provide a basis for the delimitation of the generality of interpretative hypotheses. (9, Vol.I, p.465-466)

In other words, we could "prove" ourselves right with mediocre correlations, so long as our intuitive beliefs about a naval officer group are generally congruent with the SORT findings -- but it would require very high correlations to convince us that we are wrong, and we could very well be wrong. Perhaps an

officer with 20 years service should score lower on Conformity than one with 10 years longevity, but such a conclusion would contradict intuition. (Proper use of the "level of significance" guards against such erroneous findings.)

Just such a paradox was uncovered in an experiment by Roe (9, Vol.I, p.466-477). It has long been hypothesized that "M" responses (human movement) were related to "creativity". But Roe found that M responses were less frequent among a group of high-ranking artists, and she therefore concluded that the Rorschach concept of creativity referred to "personality" rather than to "output" in the sense of artistic production. This parallels Stone's reminder that SORT scores indicate "tendencies" and not "skills".

Before leaving the subject of research significance, it would be well to mention that the field of Rorschach group comparisons abounds with examples of relatively successful studies which indicate the existence of organizational and developmental effects upon the personality. Klopfer's anthology (9), and Sherman's volume (13) include many significant contributions in the investigation of organizational (which include cultural and institutional) effects upon groups. This would lend justification to an hypothesis that service in the military does change the personality. In the realm of developmental effects, Holtzman includes a study by Thrope (9, p.181-183) which indicates group norm Rorschach score changes at a level of significance less than 1%. Louise Bates Ames has conducted several experiments with developmental changes (2, p.287-315; 12, p.160-161), especially with children and elderly people.

These indications that developmental effects do probably occur prompted the inclusion of "age" as a dependent variable in this regression analysis.

The number of studies which have proved "successful" in the areas of institutional and developmental effects is imposing, indeed -- but one cannot help but ponder the number which have produced insignificant data and may have gone unreported. The fact that those responses which produce significant changes vary from one study to another is perhaps indicative of the inconsistencies in this area. For example, Ames (2) reports increasingly high "F" (form) responses with age, while Thorpe's study (9, p.181-183) registers an increase of F in the early stages, tapering off to a decrease in later life. Ames found a change in "A" (animal) response, while Thorpe did not. It seems likely that the responses which change vary as often as the age groups studied vary. The different cultural backgrounds of the groups may also produce differences in developmental changes.

REVIEW OF THE LITERATURE

It is the opinion of the author that the field of Rorschach Psychology was researched as deeply as necessary for the purpose of this study. It was our intention to outline non-military research only to the extent necessary to justify the hypotheses. A thorough search of military records uncovered no studies which bore a direct relationship to this project. Following is a list of sources investigated:

1. A request to the Defense Documentation Center for references to all uses of the Rorschach Test in the military, with no date limit.

2. Correspondence with the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

3. Correspondence with the Psychological Research Branch of the Bureau of Naval Personnel, Navy Department, Washington, D. C.

4. An inquiry to the Personnel Research Activity, U. S. Naval Base, San Diego, California.

5. Search of the Navy Postgraduate School Library files for all pertinent references.

6. Psychological Abstracts

7. Dissertation Abstracts

8. Current Periodicals

CHAPTER II

THE STUDY

METHOD

The main function of this study was to perform multiple regression analysis of SORT score data and personal history data, using 218 male officer students of the Naval Postgraduate School as subjects. The purpose of the analysis was to find the relationships among the personal data (service tenure classifications and age) and the SORT scores. The problem, in effect, consisted of eight sub-problems:

Sub-Prob	Dependent Variable	Independent Variables
1.	Commissioned Service	15 SORT Variable Scores
2.	Former Enlisted Ser.	15 SORT Variable Scores
3.	Total Service	15 SORT Variable Scores
4.	Age	15 SORT Variable Scores
5.	Commissioned Service	25 SORT Attribute Scores
6.	Former Enlisted Ser.	25 SORT Attribute Scores
7.	Total Service	25 SORT Attribute Scores
8.	Age	25 SORT Attribute Scores

As a check on the results of the regression analysis, a discriminant analysis was performed using two sub-groups of approximately the same size and composition: 96 members of the 1964 Management Class and 100 members of the 1965 Management Class. This analysis was performed to determine if a significant "difference" existed between the two groups.

MATERIALS

Materials used in both analyses have been described previously in the Description of Terms section. They are: scores taken from the SORT tests, the BIMD 34 program, and the BIMD 05 program. There is a distinction between the SORT and the traditional Rorschach test, and perhaps that distinction should be made clear at this point. The standard Rorschach makes use of ten "ink-blots", and a score is determined by the subject's reaction (responses) to those ink blots. The test is usually given to one subject at a time, with the test administrator taking an active part and allowing the subject to elicit a wide variety of responses. The SORT uses the same 10 ink blots, but the test is administered to groups and the administrator merely acts as a projectionist and proctor. The subject is given limited, multiple-choice response, and the number of responses to each blot is fixed. This structured feature of the SORT permits its use in groups as well as making it possible for administration by field psychologists who are relatively inexperienced in Rorschach methods. Further, the scores are adaptable to quantitative analysis, a valuable feature where this study is concerned.

RESPONDENTS

Two Hundred and eighteen (218) male officer students at the U. S. Naval Postgraduate School were used as subjects for this study. These subjects were members of four distinct subgroups:

1. Members of current Management Curriculum (100)
2. Members of current Data Processing Curriculum (15)

3. Miscellaneous students, 1964-65 (7)

4. Members of the 1963-64 Management Curriculum (96)

TABLE 2, below, shows the composition of each group, and the percentages of each category relative to that group. Group designations are keyed to input data in the Appendix.

TABLE 2

SUBJECT GROUP COMPOSITION

GROUP	AVE. AGE	AVE. COMM SERV	SERV ACAD GRADS	GEN LINE	AVIA-TION	STAFF CORPS	MISC.	TOTAL
1	33.7	9.7	31 31%	33 33%	29 29%	25 25%	13 13%	100
2	31.6	8.3	11 73%	3 20%	2 13%	9 60%	1 7%	15
3	34.4	10.9	0	2 29%	5 71%	0	0	7
4	35.8	12.0	27 28%	35 36%	24 25%	27 10%	10	96
TOTALS[1] (%)			69 32%	73 34%	60 28%	61 28%	24 11%	218

PROCEDURES

Collection of Data. SORT scores from the Dreese-Russell study (5, p.43-52) for Group 4 and the scores for the remaining three groups were collected. Since the Dreese-Russell scores were "raw", it was necessary to convert this data by means of the nomagrams (14, p.284).

Subjects were listed by name, along with the T-Scores for each of the 15 SORT Variables. By either direct reference to, or interpolation of, data found in the Navy Register (3) or the Coast

[1]Vertical column totals only.

Guard Register (16), the following statistics for each subject were obtained:

1. Source of Commission (USNA, USCGA, NROTC, etc.)

2. Corps Designator (1100, 1310, 3500, etc.)

3. Years Commissioned Service at time test was taken, to nearest six months.

4. Years former enlisted service, to nearest six months.

5. Age, to nearest six months at time test was taken.

Student numbers (001-218) were then assigned to each subject and the names were discarded. Following this step, ADP cards were punched, one card per subject.

Calculation of SORT Attribute Scores. Since one-half of this study was a multiple regression analysis using the Attribute scores, the next step was to calculate the Attribute values as functions of the SORT Variable scores used in the other half of the study. Formulae for this calculation are included with each Attribute definition in the Appendix.

Program REGRESS 1 (see Appendix) was used for this task. In this problem, Y(1,J) through Y(15, J) are the SORT Variables, while TY(1,J) through TY(25,J) are the SORT Attributes. "J" represents the student numbers, and this J value in the DO Loop permits computation of all 25 personality factors for each of the 218 subjects.

The formulae used in REGRESS 1 were deduced from the SORT Manual descriptions (14, p.13-14) and by analysis of the ABAC tables (14, p.25-27). The "S-Equivalent" and "CF-Equivalent" factor formulae (SEQ and CFEQ) were obtained through graphical

analysis. An IF statement provides for the three variations in the SEQ formula which are determined by the value of S in relation to 50.

Eight of the Attribute scores (8, 9, 17, 18, 19, 21, 23, and 25) begin at negative values, ranging from -60 to +60. To facilitate plotting and to render the scores more adaptable to the BIMD program series, a constant, 60, was added to each such formula. This resulted in a positive range from 0 to 120 for each of those eight variables. This change would not effect the results of the study.

Preparation of BIMD Programs. Control data cards for the BIMD 34 program were then prepared. Since the input data did not include a figure for Total Service, it was necessary to use a transgeneration card in the program to add the values of Commissioned Service and Enlisted Service. This sum, total service, was designated LONGEV and inserted into the problems as a dependent variable.

Computer Use. Two main problems were run with the BIMD 34 program on the CDC 1604 Computer: one was an analysis of the relationship between the service tenure categories and SORT Variables, and the other between service tenure and the SORT Attributes.

RESULTS

The following results were obtained from the main program:

SORT Variable Analysis: The highest correlation achieved with this particular analysis was .14306 between Age as the dependent variable and FC (responses involving color and closely resembling the form of the stimulus). This indicates slight, almost negligible correlation.

SORT Attribute Analysis: The highest correlation in this matrix is .14907, between Enlisted Service as the dependent variable and Moodiness as the independent variable. This also indicates slight, almost negligible correlation.

Correlation Matrices: Tables 3 and 4, beginning on the next page, are the correlation matrices for the two main programs.

TABLE 3

SORT VARIABLE CORRELATION MATRIX

		* ES	* AGE	* LONG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	COM SER*	
*	COM SER	-.07	.82	.75	.08	-.04	-.08	-.05	-.02	-.18	.05	.01	.10	-.02							CS*
*	ENL SER	------	.40	.62	.01	.01	-.01	.02	-.05	.06	-.06	.10	0	0							ES*
*	AGE	----------		.92	.10	-.05	-.10	-.04	-.07	-.12	-.01	.03	.14	-.03							AGE*
*	LONGEVITY	----------			.07	-.03	-.07	-.02	-.05	-.10	0	.08	.08	-.02							LONG*
1.	W	----------				-.80	-.47	-.21	-.67	-.20	.29	.02	.22	.25							1
2.	D	----------					-.12	-.03	.44	.17	-.22	0	.03	-.16							2
3.	Dd	----------						.38	.47	.10	-.23	-.02	-.42	-.16							3
4.	S	----------							.36	.07	-.12	.01	-.23	-.32							4
5.	F	----------								-.03	-.30	-.08	-.30	-.36							5
6.	F-										-.24	-.26	-.07	-.16							6
7.	M											.07	-.15	.05							7
8.	FM												-.06	-.02							8
9.	FC												----	-.16	.14	.17	-.18	.33	-.28	------	9
10.	CF												------	----	.15	-.16	.03	.18	-.13	------	10
11.	FCh	.02	.06	.04	.53	-.46	-.18	-.12	-.53	-.15	-.24	-.18	----------		----	-.21	-.11	.17	-.15	.03	11
12.	A	.02	.03	.02	-.25	.20	.18	-.13	.21	.09	-.37	.35	----------			----	-.31	-.12	0	.01	12
13.	H	-.07	-.07	-.05	.26	-.21	-.15	-.06	-.21	-.19	.71	.07	----------				----	.15	-.01	0	13
14.	P	-.07	.09	.03	.54	-.26	-.51	-.05	-.41	-.22	.33	.01	----------					----	-.69	.10	14
15.	O	.09	-.04	.02	-.44	.24	.37	.08	.30	.21	-.16	-.15	----------						----	-.05	15
		ES	AGE	LONG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	COM SER *	

NOTE: * indicates DEPENDENT Variables. Only correlations between Dependent Variables, individually, and INDEPENDENT Variables (1-15) are pertinent to the problem. Correlations among the Dependent Variables, and among the Independent Variables, do not pertain.

TABLE 4

SORT Attribute CORRELATION MATRIX - Part 1

		ES	AGE	1	2	3	4	5	6	7	8	9	10
*	COMM SERV	-.07	.82	.08	-.04	-.08	.08	.01	-.05	-.02	.07	.02	0
*	EML SERV		.40	.01	.01	-.01	-.03	-.05	.02	-.06	-.08	-.06	-.07
*	AGE			.10	-.05	-.10	.06	-.04	-.04	-.07	0	-.02	-.07
1.	THEORETICAL				-.80	-.47	.80	-.28	-.21	-.67	-.48	.45	.26
2.	PRACTICAL					-.12	-.63	.49	-.03	.44	.30	-.30	-.21
3.	PEDANTIC						-.44	-.28	.38	.47	.35	-.35	-.15
4.	INDUCTION							.29	-.20	-.60	-.39	.67	.60
5.	DEDUCTION								-.13	.03	.07	.35	.50
6.	RIGIDITY									.36	.28	.06	-.06
7.	STRUCTURING										.88	-.36	-.21
8.	CONCENTRATION											-.21	-.09
9.	RANGE OF INTERESTS												.63
10.	HUMAN RELATIONS												
11.	POPULAR												
12.	ORIGINAL												
13.	PERSISTENCE												
14.	AGGRESSIVENESS												
15.	SOCIAL RESPONSIBILITY												
16.	COOPERATION												
17.	TACT												
18.	CONFIDENCE												
19.	CONSISTENCY												
20.	ANXIETY												
21.	MOODINESS												
22.	ACTIVITY POTENTIAL												
23.	IMPULSIVENESS												
24.	FLEXIBILITY												
25.	CONFORMITY												
*	LONGEVITY (LON)												

NOTE: * indicates DEPENDENT variables. Only correlations between Dependent Variables, individually, and INDEPENDENT Variables (1-25) are pertinent to the problem. Correlations among the dependent variables, and among the independent variables, do not pertain.

TABLE 4

SORT Attribute CORRELATION MATRIX - Part 2

	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	*LOC
*CS	.10	-.05	-.05	.02	.10	.06	.06	.03	-.05	.03	-.08	.05	-.07	.08	.08	.75
*LS	-.07	.09	.02	-.10	-.05	0	-.11	-.11	-.05	.02	.15	-.06	.08	-.05	-.09	.61
*AGE	.09	-.04	-.04	-.07	.08	.08	.03	-.03	-.10	.06	.02	-.01	0	.05	.07	.92
1.	.54	-.44	-.21	-.38	.40	.36	.23	.23	-.66	.53	.23	.29	.48	.25	.53	.07
2.	-.26	.24	-.02	.23	-.16	-.10	-.10	-.18	.49	-.46	-.11	-.22	-.30	-.13	-.28	-.03
3.	-.51	.37	.38	.25	-.47	-.44	-.27	-.18	.34	-.18	-.16	-.23	-.35	-.30	-.48	-.07
4.	.54	-.37	-.20	.07	.72	.18	.40	.63	-.49	.18	-.13	.81	.39	.68	.49	.04
5.	.12	.02	-.13	.60	.57	-.14	.30	.58	.21	-.53	-.47	.75	-.07	.67	.05	-.02
6.	-.05	.09	1.00	.23	-.25	-.42	-.16	-.11	-.16	-.12	-.15	-.12	-.28	-.07	-.07	-.02
7.	-.41	.30	.36	.68	-.45	-.51	-.22	-.20	.91	-.53	-.57	-.30	-.88	-.25	-.38	-.05
8.	-.24	.16	.28	.69	-.27	-.35	-.21	-.15	.77	-.39	-.71	-.14	-1.00	-.13	-.22	0
9.	.48	-.24	.06	.15	.49	.09	.47	.65	-.34	.16	-.29	.62	.21	.48	.38	-.02
10.	.15	-.01	-.06	.35	.49	-.11	.24	.54	-.10	-.11	-.31	.71	.09	.57	.08	-.05
11.	----	-.69	-.05	-.12	.50	.39	.29	.26	-.34	.17	.01	.33	.24	.36	.91	.03
12.	----------		.08	.15	-.32	-.32	-.08	-.04	.25	-.15	-.10	-.16	-.16	-.20	-.93	.02
13.	----------			.23	-.25	-.42	-.16	-.11	.16	-.12	-.15	-.12	-.28	-.08	-.07	-.02
14.	----------				.17	-.52	.12	.42	.72	-.67	-.86	.49	-.69	.41	-.15	-.05
15.	----------					.35	.60	.62	-.28	-.11	-.22	.76	.27	.90	.44	.04
16.	----------						.27	-.02	-.43	.22	.30	-.07	.35	-.08	.38	.05
17.	----------							.83	-.16	.07	-.42	.41	.21	.52	.20	-.03
18.	----------								-.11	-.08	-.59	.78	.16	.67	.16	-.05
19.	----------									-.71	-.55	-.14	-.77	-.10	-.32	-.07
20.	----------										.37	-.24	.39	-.22	.17	.04
21.	----------											-.44	.71	-.38	.06	.04
22.	----------												.16	.84	.26	0
23.	.24	-.16	-.27	-.69	.27	.35	.21	.15	-.77	.39	.71	.14	---	.13	.21	0
24.	.35	-.20	-.08	.42	.90	-.08	.52	.67	-.10	-.22	-.38	.85	.12	----	.30	.03
25.	.91	-.93	-.07	-.15	.44	.38	.20	.16	-.32	.17	.06	.26	.21	----------		0

As no significant correlations emerged from these two computer runs, the following steps were taken to test the validity of the study to this point:

1. Matrix Comparison. The historical SORT Variable correlation matrix (14, p.10) was compared with TABLE 3. Although Holtzman discourages such a comparison (8, p.146), it was felt that a favorable match between the two matrices would supply a clue to validity. The resemblence was slight. This comparison of matrices would have no bearing on comparative naval officer-civilian SORT scores, but merely is a test of relationships among the SORT Variables themselves.

2. Removal of High Deviations. The cards of all subjects with any one score falling outside the range of plus or minus two standard deviations from the mean were removed from the deck. This was done under the premise that some inaccuracies of the test situation might have upset the correlations. This step did not improve correlations, nor did the new correlation matrix compare favorably (or even closer to) the matrix in the SORT Manual. Only the SORT Variable problem was used for this validity check, since the Attributes are functions of the Variables.

3. Discriminant Analysis. A discriminant analysis was run on Groups 1 and 4. A glance at TABLE 2 will show that these two groups are similar in both size and occupational group composition (aviators, general line, staff, etc.), but Average Age and Average Commissioned Service are more than two years greater for Group 4. If it were found, in the BIMD 34 program regression

analysis, that personality characteristics do change in relation to age and tenure, then a significant "difference" between the two groups from the BIMD 05 calculations would serve to confirm those findings. It would be necessary, however, for the variables which show the greatest differences in the BIMD 05 program to correspond with those BIMD 34 variables with the highest correlations. Results of the discriminant analysis between Groups 1 and 4 are tabulated below:

TABLE 5

DISCRIMINANT ANALYSIS -- GROUPS 1 AND 4

VARIABLE	MEAN, GRP 1	MEAN, GRP 4	DIFFERENCE	ORDER
1. W	51.27	52.82	-1.55	8
2. D	49.68	49.06	.62	13
3. Dd	50.18	47.84	2.34	4
4. S	52.28	54.84	-2.56	3
5. F	58.32	57.31	1.01	11
6. F-	49.79	48.03	1.76	6
7. M	51.20	52.54	-1.34	9
8. FM	53.19	53.91	- .72	12
9. FC	49.84	49.98	- .14	15
10. CF	42.04	39.45	2.59	2
11. Fch	47.69	49.26	-1.57	7
12. A	51.71	48.67	3.04	1
13. H	50.63	50.19	.44	14
14. P	47.65	49.61	-1.96	5
15. O	38.55	39.81	-1.26	10

The above discriminant analysis results in an F-Statistic of 2.84 with 180 degrees of freedom. From Yamane's Table 5 (18, Appendix),

this indicates a significant difference between the two groups at a level of significance of less than 1%. Although time did not permit further analysis, the author intends to perform further discriminant analysis on these two groups as an extension project, treating Age and Commissioned Service as variables along with the SORT scores. This procedure should determine whether or not Age and Commissioned Service are the discriminant factors.

SUMMARY AND CONCLUSIONS

Summary. This study was undertaken to investigate the possible existence of an effect of service tenure upon personality characteristics as measured by the Structured-Objective Rorschach Test (SORT). The entire field of Rorschach Psychology was researched in an effort to find examples of quantitative and qualitative experiments which sought for and (if found) measured organizationally and developmentally induced differences in group personality characteristics.

On the quantitative side, sufficient parallels were uncovered which indicated that such effects upon human behavioral characteristics could exist -- enough evidence to justify the continuation of this study beyond the first stages.

Using BIMD computer programs, statistical methods were employed in a multiple regression analysis. Service Tenure (commissioned service, enlisted service, total service of the 218 subjects) and Age served in separate sub-problems as dependent variables. Two sets of SORT scores (one quantitative and the other qualitative) for each subject were used as independent

variables. All correlations were found to be below a value of .20, and all were considered negligible.

Conclusions. From the results of this study, the following conclusions have been determined:

1. Multiple regression analysis reveals no apparent relationship between Service Tenure and Personality Characteristics as measured by the Structured-Objective Rorschach Test (SORT). By the same methods, no apparent relationship exists between Age and SORT personality scores.

2. Although BIMD 05 did discriminate between Groups 1 and 4, this procedure failed to substantiate the results of the BIMD 34 regression analysis. In TABLE 5, the most discriminating variables are A, CF, and S, in that order. The BIMD 34 correlation matrix (TABLE 3) shows:

	Correlation Coefficients	
	AGE	COMMISSIONED SERV.
A	.0298	.0117
CF	-.0309	-.0214
S	-.0376	-.0463

From TABLE 2, Average Age and Average Commissioned Service for Group 4 are over two years greater than for Group 1, while the group sizes and occupational compositions are comparable. Since the two groups are significantly "different", and differ mostly in the SORT scores for A, CF, and S, it would seem that the regression correlation coefficients for A, CF, and S versus Age and Commissioned Service should be relatively high. This is not the case.

3. If relationships do, in reality, exist among the dependent and independent variables of this study, failure to achieve correlations could be attributed to the following:

a. This study did not conduct discriminant analyses between the distinct occupational sub-groups (aviators vs General Line, etc.). Differences among these groups may have served to counteract one another.

b. Influences of the test situation may have caused deviations beyond normal proportions.

4. Results indicating that the SORT scores are apparently random do not detract from the value of this study. On the contrary, pre-recruitment and pre-commissioning psychology test administrators would benefit by the knowledge that personality characteristics will maintain consistency throughout subsequent military service.

RECOMMENDATIONS

In view of the results of this study, the following recommendations are submitted:

1. That a discriminant analysis be conducted with this subject group to investigate possible deleterious effects mentioned in paragraph 2.a. of the Conclusions.

2. That a discriminant analysis be conducted between sub-groups 1 and 4, using Age and Commissioned Service as variables along with the SORT scores, to determine if the former are determinant factors.

3. That, in the future, particular emphasis be placed on standardizing the test situation in every detail, and that

test-retests be given at intervals throughout the group as a check on the test situation.

4. That this study be repeated each year for several years in order that the value of the SORT for military group comparisons definitely may be determined.

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SUBJECT PERSONAL DATA

STU NUM	GRP	SEX	EDUC	COLL SER	GRAD SER	AGE
1	1	1	2	7		29
2	1	2	8	11		35
3	1	2	8	11		34
4	1	2	5	11		34
5	1	1	1	16		37
6	1	2	1	7	1	31
7	1	1	5	12	1	36
8	1	1	1	7	2	31
9	1	1	1	15	2	39
10	1	2	8	4	11	35
11	1	8	2	13	9	39
12	1	2	1	7		28
13	1	2	2	11	1	34
14	1	2	5	7		28
15	1	2	1	9		31
16	1	2	5	12	3	37
17	1	2	6	12		34
18	1	2	2	7		30
19	1	2	2	16	4	38
20	1	1	1	10		32
21	1	2	2	11	5	35
22	1	2	8	13		36
23	1	1	2	13		36
24	1	2	5	8		30
25	1	2	2	8	5	30
26	1	2	2	11	2	35
27	1	1	2	5		27
28	1	2	1	18	3	40
29	1	2	6	14	6	39
30	1	2	1	10	1	35
31	1	1	5	14	1	37
32	1	2	8	15	2	37
33	1	1	8	8	2	29
34	1	2	1	6		28
35	1	2	5	7		29
36	1	2	1	10		35
37	1	2	2	10		31
38	1	2	2	16	5	39
39	1	2	8	13	5	38
40	1	2	2	11		33
41	1	2	1	6		28
42	1	2	8	5	8	32
43	1	2	1	6	2	29
44	1	2	1	11		34
45	1	2	5	13	7	40
46	1	2	1	6	6	29
47	1	2	5	13		36
48	1	1	1	6		29
49	1	2	2	12		34
50	1	2	5	9		31
51	1	2	2	6	1	31
52	1	2	1	7		30
53	1	2	1	11	2	36
54	1	2	5	14	5	38
55	1	1	1	4		26
56	1	1	5	9	1	33
57	1	2	2	11	5	35
58	1	1	8	6	16	38
59	1	1	6	10	1	32
60	1	2	1	9	6	33
61	1	2	8	7		30
62	1	2	2	6		29
63	1	2	2	12	2	36
64	1	1	1	10		32
65	1	2	1	9		30
66	1	1	5	11	2	35
67	1	2	2	5	1	28
68	1	1	5	17		39
69	1	1	2	6		36
70	1	1	5	15	3	40
71	1	2	2	5	1	28
72	1	2	2	10	2	34
73	1	2	8	10		33
74	1	2	1	12	6	39
75	1	1	1	15		38
76	1	2	5	12	7	37
77	1	2	1	10		32
78	1	1	1	3		26
79	1	2	5	6		27
80	1	2	1	7	3	31
81	1	2	2	14		36
82	1	2	2	6		31
83	1	2	1	7		30
84	1	2	1	8		30
85	1	1	1	13		34
86	1	2	8	4	17	38
87	1	1	2	5		27

LEGEND ON PAGE 36

STU NUM	GRP	SRC	DES	COL SCR	MIL SCR	AGE
88	1	1	2	5		27
89	1	2	5	12	4	36
90	1	2	2	18	3	42
91	1	1	6	11	1	34
92	1	2	5	10	6	38
93	1	1	2	5		27
94	1	2	1	9		30
95	1	1	5	6	4	32
96	1	1	1	8	1	33
97	1	1	2	13	2	37
98	1	1	6	8		31
99	1	2	8	12	7	37
100	1	2	1	10	5	33
101	2	1	5	10	1	33
102	2	2	8	13		34
103	2	1	5	12	2	37
104	2	1	5	7	1	29
105	2	1	1	5	2	31
106	2	2	1	3		26
107	2	2	2	5		27
108	2	2	5	8		31
109	2	1	5	7		31
110	2	1	2	5		28
111	2	1	5	10		33
112	2	1	1	6		30
113	2	1	5	9		32
114	2	1	5	14	2	38
115	2	1	5	10	3	34
116	3	2	2	10	5	33
117	3	2	2	13	3	34
118	3	2	1	6	12	35
119	3	2	2	12	5	35
120	3	2	1	6		30
121	3	2	2	16	4	38
122	3	2	2	13	3	36
123	4	2	1	6	1	29
124	4	2	2	8		31
125	4	1	2	11	1	34
126	4	2	1	11	3	35
127	4	1	5	3	5	31
128	4	1	5	13	7	40
129	4	2	6	7		29
130	4	2	1	9	1	32
131	4	1	1	17		39
132	4	2	2	16	5	41
133	4	2	1	16	4	38
134	4	2	5	12	3	37
135	4	2	1	12	7	39
136	4	2	8	4	14	36
137	4	1	2	11	1	34
138	4	2	5	15	4	37
139	4	2	5	11	2	33
140	4	2	1	18	3	40
141	4	2	2	10	1	34
142	4	2	8	11	1	34
143	4	1	1	18		41
144	4	1	5	14	2	39
145	4	1	5	12	1	35
146	4	2	6	6	2	31
147	4	2	2	14	2	36
148	4	2	2	8	1	29
149	4	2	2	16	4	39
150	4	2	1	18	3	39
151	4	2	5	14	7	39
152	4	2	1	6		28
153	4	1	2	12		36
154	4	1	5	15		39
155	4	2	8	5	5	33
156	4	2	1	8	1	30
157	4	1	1	10	5	37
158	4	2	2	13	8	39
159	4	2	5	15	4	37
160	4	1	6	6	2	31
161	4	2	2	17	3	38
162	4	2	1	9	8	37
163	4	1	2	12		35
164	4	2	1	12		35
165	4	1	1	6	2	32
166	4	2	5	13	4	40
167	4	2	2	14	4	37
168	4	2	5	13		35
169	4	2	2	14	3	36
170	4	2	1	18	6	43
171	4	2	1	16	4	40
172	4	2	1	10	1	33
173	4	1	8	17		40
174	4	2	1	13		35
175	4	2	5	4	10	33

STU NUM	GRP	SRC	DES	COM SER	ENL SER	AGE
176	4	2	8	5	10	33
177	4	2	5	11		33
178	4	2	1	6	11	34
179	4	2	2	12	3	35
180	4	2	5	14	6	39
181	4	2	2	15	6	40
182	4	2	2	16	5	40
183	4	2	1	9		31
184	4	2	1	10	1	33
185	4	1	1	18		42
186	4	1	2	16		37
187	4	2	1	14	1	36
188	4	2	5	13	2	37
189	4	1	1	9	1	32
190	4	2	8	6	15	38
191	4	2	1	16	4	37
192	4	2	1	17		38
193	4	2	6	11		33
194	4	2	5	14	5	36
195	4	2	2	15	5	40
196	4	1	5	8		30
197	4	2	8	4	15	36
198	4	2	8	18	2	38
199	4	2	1	9	1	31
200	4	1	2	13		35
201	4	1	6	15	2	39
202	4	2	5	12		34
203	4	2	5	14	6	38
204	4	1	2	8	1	30
205	4	1	1	18	2	41
206	4	2	8	12	7	39
207	4	2	1	11	1	33
208	4	2	2	14	1	38
209	4	2	2	13	2	35
210	4	2	1	10	1	34
211	4	2	5	11	6	36
212	4	2	2	17		38
213	4	2	5	14		39
214	4	2	1	18	2	39
215	4	1	1	14		37
216	4	1	1	13		35
217	4	1	8	8		30
218	4	1	1	9	2	35

LEGEND

GRP -- Group Number

SRC -- Source Code

1 - Service Academy
2 - Non-Academy

DES -- Designator Code

1 - General Line
2 - Aviator
5 - Supply Corps
6 - CEC
8 - Miscellaneous

COM SER -- Commissioned Service

ENL SER -- Enlisted Service

AGE -- Age

VARIABLE SCORES

STU NBR	1 W	2 D	3 DD	4 S	5 F	6 F-	7 M	8 FM	9 FC	10 CF	11 FCH	12 A	13 H	14 P	15 O
1	52	58	37	45	50	57	47	55	47	40	57	57	56	48	40
2	60	53	30	50	50	50	55	45	67	35	50	50	52	65	20
3	45	48	65	55	70	47	50	55	45	50	40	38	55	46	40
4	58	50	40	62	67	40	60	40	42	50	52	22	52	55	30
5	75	38	35	45	37	57	58	40	55	52	55	47	50	62	25
6	55	38	67	55	57	52	45	50	47	40	57	57	47	46	45
7	48	50	55	55	77	62	55	45	42	27	37	50	45	46	35
8	52	41	65	57	77	50	42	40	42	45	50	63	43	50	43
9	67	41	40	45	35	47	60	65	60	35	55	55	52	42	30
10	55	51	42	42	52	50	50	50	50	35	60	51	66	28	43
11	60	45	45	60	55	42	58	62	50	45	45	47	52	52	37
12	58	45	50	67	70	47	42	55	40	45	55	42	50	52	35
13	52	53	42	55	60	52	50	65	45	45	37	47	55	51	30
14	55	45	55	55	57	50	30	65	55	45	50	61	45	55	30
15	36	66	42	45	60	50	47	40	47	52	52	47	41	53	43
16	60	36	60	57	62	52	55	55	47	40	42	63	45	62	25
17	65	41	42	47	47	40	75	60	47	40	47	51	75	62	20
18	70	35	50	45	42	60	47	57	45	35	62	57	47	51	37
19	58	48	42	47	55	45	55	50	60	52	45	55	50	58	30
20	42	60	45	62	67	45	47	67	45	35	42	60	55	58	30
21	50	50	52	47	60	55	65	40	45	40	42	38	62	42	60
22	67	41	40	60	42	45	65	62	55	27	57	50	62	72	20
23	52	50	50	55	55	47	45	62	50	35	55	51	52	55	35
24	52	48	52	65	60	47	70	60	40	45	37	42	60	51	37
25	60	43	50	47	45	60	50	50	55	25	65	40	43	42	40
26	50	55	52	37	60	57	42	55	47	52	42	60	47	43	37
27	52	45	55	62	62	45	45	55	60	32	52	53	55	55	35
28	55	41	60	57	80	47	47	37	42	35	47	40	55	43	37
29	55	55	37	50	42	50	70	60	55	40	42	53	58	61	30
30	52	50	50	42	70	37	42	50	60	35	57	55	55	41	43
31	65	40	42	50	47	37	60	62	60	32	55	50	65	41	37
32	33	60	57	47	67	52	30	45	47	40	57	53	47	41	43
33	42	53	57	57	60	62	55	45	50	40	37	45	60	35	50
34	40	53	60	50	60	55	80	45	42	40	22	50	80	45	37
35	52	48	52	60	62	50	45	37	62	32	57	40	41	51	30
36	36	61	50	45	72	55	42	57	50	35	35	40	41	35	40
37	78	35	35	45	35	47	75	55	47	52	50	38	70	52	30
38	38	60	52	47	75	50	58	60	42	50	25	60	60	41	50
39	46	55	50	32	42	42	55	60	50	62	47	53	45	50	40
40	61	45	42	42	45	60	47	32	62	50	57	53	47	48	45
41	58	41	55	55	50	50	65	55	45	52	42	47	66	62	35
42	55	41	60	67	75	52	47	45	42	45	42	32	37	46	43
43	50	41	67	55	57	60	45	57	45	50	42	63	55	35	55

STU NBR	1 W	2 D	3 DD	4 S	5 F	6 F-	7 M	8 FM	9 FC	10 CF	11 FCH	12 A	13 H	14 P	15 O
44	45	45	70	67	80	30	55	72	35	40	40	63	52	30	50
45	40	53	60	50	75	42	42	57	55	40	42	67	41	41	43
46	45	53	55	47	67	40	58	65	40	50	40	61	56	41	37
47	42	60	45	47	70	52	42	40	65	32	45	60	45	41	50
48	36	65	45	45	72	55	27	40	67	45	40	60	41	40	45
49	40	56	52	57	80	47	30	50	62	32	42	55	40	40	50
50	38	45	80	70	65	55	45	65	40	40	42	55	45	38	50
51	61	38	55	55	50	50	65	57	42	50	45	55	65	55	35
52	58	41	55	57	62	45	58	50	40	60	42	61	47	46	43
53	48	51	52	42	50	55	65	40	60	40	42	63	43	58	25
54	48	58	40	40	45	45	65	57	50	35	55	51	65	51	40
55	70	38	42	47	45	40	50	65	47	45	62	51	50	52	40
56	46	55	50	45	60	55	58	60	40	50	37	45	60	50	37
57	60	46	42	37	50	45	50	57	62	45	50	55	47	51	37
58	42	58	50	55	65	50	42	57	47	45	45	55	35	42	30
59	42	51	57	50	70	62	50	45	42	32	47	53	50	33	40
60	36	61	52	57	70	47	55	37	47	40	50	45	52	41	45
61	58	45	50	55	45	52	55	60	47	45	52	63	56	62	25
62	65	40	45	57	45	47	65	60	45	45	50	51	68	50	37
63	56	55	35	32	30	50	45	65	67	50	55	60	47	52	37
64	50	53	45	42	50	47	75	57	55	30	42	40	68	46	35
65	61	33	65	50	70	52	47	57	42	35	45	57	55	46	37
66	36	66	42	47	67	47	40	57	55	45	45	65	32	48	35
67	61	46	40	50	50	52	55	57	45	40	55	55	56	55	37
68	58	46	45	47	50	45	58	57	45	52	52	45	55	53	35
69	55	51	42	55	60	50	45	37	60	45	55	57	41	63	25
70	36	68	40	57	70	62	35	50	62	30	42	67	35	43	35
71	48	56	42	50	65	40	45	65	47	40	50	60	32	42	50
72	50	51	50	50	52	57	42	40	37	45	47	50	40	52	30
73	27	76	42	60	77	65	50	57	50	32	27	51	41	36	50
74	50	63	57	65	60	52	35	55	55	45	52	60	56	51	40
75	46	48	60	55	70	57	42	57	40	45	42	71	47	43	37
76	33	63	55	60	70	57	30	45	45	40	55	60	40	32	80
77	40	48	70	70	72	57	70	60	35	32	27	50	60	45	55
78	55	46	52	60	57	50	58	45	40	40	62	30	56	55	35
79	48	53	50	40	55	57	45	40	42	57	52	47	32	51	30
80	60	46	42	45	37	40	65	45	55	62	52	47	50	48	40
81	35	55	67	47	50	50	58	55	60	40	47	63	56	40	45
82	50	53	42	60	52	47	50	57	55	45	50	45	52	56	35
83	38	56	57	55	62	47	55	55	62	40	37	53	50	43	45
84	52	51	45	60	57	57	45	45	62	35	47	63	56	51	30
85	73	41	30	50	37	50	58	60	55	45	55	51	52	65	20
86	61	50	35	57	47	47	45	60	60	45	55	45	52	56	35
87	27	65	60	47	77	50	30	50	50	50	40	65	30	35	45
88	52	50	50	57	45	55	42	45	47	52	65	40	55	31	60

STU NBR	1 W	2 D	3 DD	4 S	5 F	6 F-	7 M	8 FM	9 FC	10 CF	11 FCH	12 A	13 H	14 P	15 O
89	50	45	60	60	60	40	65	55	47	45	50	38	56	48	25
90	48	51	52	65	60	55	30	50	50	45	57	45	30	43	37
91	40	45	75	80	80	42	45	45	45	27	42	40	37	33	65
92	70	31	55	45	47	52	50	57	45	45	57	60	45	53	37
93	55	46	52	47	45	55	40	60	47	45	62	40	43	33	35
94	45	56	50	40	65	35	58	65	47	52	37	65	47	45	35
95	52	45	57	60	65	52	47	67	47	32	37	73	37	45	30
96	55	45	55	57	60	50	47	57	62	35	42	53	41	41	40
97	55	51	42	65	65	47	55	57	45	32	50	45	58	53	37
98	58	43	52	40	50	47	50	50	60	30	65	53	45	45	43
99	45	51	57	47	67	45	70	62	37	45	35	47	70	41	60
100	54	58	28	49	43	48	48	40	60	54	60	20	54	56	37
101	58	51	37	50	57	42	50	55	62	40	50	47	40	65	20
102	67	38	45	62	45	50	72	40	40	40	62	30	72	41	50
103	48	46	60	70	70	52	45	37	62	35	45	42	47	45	60
104	40	56	55	57	57	47	60	57	47	40	45	42	62	50	45
105	46	48	60	47	52	52	47	50	60	32	57	51	41	52	40
106	67	38	45	45	47	40	65	50	45	52	57	36	70	40	55
107	61	53	27	55	45	45	65	57	50	52	45	35	55	66	37
108	56	43	55	50	67	52	47	40	55	35	47	50	52	40	62
109	36	56	60	60	60	50	42	50	40	45	65	36	37	42	43
110	46	58	42	57	65	45	60	57	60	30	40	42	55	55	37
111	48	58	40	42	62	62	65	40	42	40	35	42	65	41	60
112	50	51	50	57	67	57	47	45	45	32	50	36	50	51	35
113	50	55	42	47	42	47	65	62	50	45	45	57	62	48	37
114	50	53	45	62	60	55	60	62	62	25	32	57	47	52	43
115	33	72	40	47	80	52	35	55	47	35	40	53	43	45	43
116	38	58	55	57	70	52	40	62	50	35	40	61	32	45	37
117	33	58	65	42	67	40	58	55	50	32	50	55	40	40	40
118	46	61	37	47	47	62	58	57	50	45	37	51	56	45	45
119	40	51	65	55	75	42	45	57	40	40	52	55	52	31	60
120	56	51	40	50	47	47	72	50	47	32	55	51	58	63	30
121	61	35	60	57	47	52	55	55	47	50	52	47	50	55	40
122	52	53	42	50	47	42	65	65	62	45	35	60	50	61	25
123	58	55	30	50	42	67	55	55	47	45	42	53	56	55	37
124	55	41	60	45	62	45	35	45	67	32	60	67	43	43	35
125	56	45	52	57	57	52	55	57	45	32	52	42	37	40	37
126	56	41	57	55	57	45	42	62	55	32	57	71	50	61	35
127	46	58	42	50	62	45	42	55	50	50	52	40	45	45	45
128	60	50	37	65	50	47	55	57	62	32	52	51	56	63	20
129	35	58	60	62	80	40	62	57	42	35	35	51	66	50	40
130	42	48	67	67	70	47	40	55	47	35	52	53	40	36	40
131	52	48	50	50	57	40	72	40	60	35	47	36	65	61	30
132	63	45	40	50	50	50	60	57	55	35	47	51	50	58	40
133	42	61	42	57	77	47	45	50	62	30	37	63	37	42	45
134	61	46	40	65	50	50	58	45	60	30	60	30	62	63	35

STU NBR	1 W	2 D	3 DD	4 S	5 F	6 F-	7 M	8 FM	9 FC	10 CF	11 FCH	12 A	13 H	14 P	15 O
135	63	38	52	47	47	42	62	45	40	50	52	40	55	56	43
136	73	40	35	45	25	52	60	60	50	52	60	35	55	56	25
137	45	53	55	60	62	52	62	55	50	32	37	50	50	40	43
138	76	31	42	57	27	35	50	62	62	60	65	36	55	62	25
139	42	53	55	62	62	57	45	60	55	40	37	60	50	53	40
140	48	53	42	55	67	47	72	50	47	32	32	40	58	51	40
141	46	58	42	62	52	62	47	57	60	32	42	55	47	50	45
142	58	41	55	65	57	47	60	50	37	40	60	36	52	60	30
143	61	50	35	40	32	47	40	57	55	55	71	57	40	52	37
144	50	51	42	37	52	50	60	40	47	57	42	26	43	48	50
145	65	48	30	55	45	52	60	45	65	40	47	45	56	65	30
146	42	50	65	67	65	40	70	60	42	35	42	42	60	48	35
147	45	51	55	55	70	37	65	55	42	35	47	42	68	41	55
148	50	55	42	50	60	57	55	60	50	30	40	57	58	48	50
149	50	46	57	65	50	57	65	57	40	40	45	35	56	45	55
150	55	41	60	60	45	55	47	55	47	52	55	35	43	53	25
151	46	53	52	62	60	50	47	70	45	32	45	67	52	38	40
152	48	55	45	62	77	50	45	50	62	30	35	50	35	51	43
153	56	51	42	45	60	57	58	45	55	40	37	50	55	53	45
154	36	55	65	62	80	42	30	57	40	52	50	55	41	41	55
155	56	46	45	57	62	47	60	40	40	55	45	45	52	62	30
156	50	45	60	50	70	52	47	50	50	30	47	51	52	48	45
157	42	51	55	62	80	60	42	57	47	30	20	65	40	36	40
158	48	53	50	62	42	52	40	60	62	40	47	57	55	52	35
159	48	53	50	55	55	45	55	60	47	35	55	60	65	40	43
160	67	43	37	55	45	42	65	50	47	55	52	36	58	63	20
161	46	50	57	60	60	52	58	50	45	35	50	51	58	55	43
162	55	43	57	60	57	60	30	55	60	30	57	53	40	40	35
163	40	55	57	55	77	47	50	50	40	40	45	50	50	52	40
164	65	46	35	57	52	52	50	35	55	45	60	35	47	63	37
165	56	53	37	55	37	47	70	55	65	35	47	38	55	58	37
166	55	48	50	55	62	40	58	55	55	30	55	40	68	52	37
167	56	45	52	50	62	45	60	50	60	32	45	55	52	52	40
168	63	41	45	57	40	52	45	60	47	52	57	50	40	52	35
169	35	70	40	57	80	50	45	50	47	32	42	51	35	42	50
170	73	30	52	45	50	42	60	55	47	45	57	47	62	43	37
171	46	46	65	60	65	52	50	40	55	32	50	53	56	43	43
172	38	61	50	60	67	52	45	60	42	35	45	42	55	33	55
173	52	50	45	42	65	37	75	55	45	40	37	35	66	43	50
174	55	45	55	62	55	55	50	57	47	35	50	45	52	38	60
175	36	56	60	57	55	70	55	57	40	32	42	42	43	25	80
176	48	51	52	50	45	50	47	65	50	45	52	55	40	55	43
177	73	33	42	55	25	40	58	62	65	50	65	47	47	67	30
178	80	28	42	57	37	42	62	35	60	45	71	25	56	63	30
179	55	56	35	40	67	47	47	57	62	35	37	55	45	46	40
180	60	46	42	55	60	32	58	60	50	45	52	57	50	48	55

STU NBR	1 W	2 D	3 DD	4 S	5 F	6 F-	7 M	8 FM	9 FC	10 CF	11 FCII	12 A	13 H	14 P	15 O
181	63	41	45	60	45	52	42	57	60	40	60	50	37	60	35
182	58	45	50	50	47	55	50	55	50	50	50	50	52	55	37
183	55	50	45	60	60	47	42	57	47	40	55	53	35	46	20
184	61	53	27	47	35	50	55	60	67	32	57	61	47	52	40
185	60	46	40	47	45	45	62	57	47	50	52	42	56	51	35
186	58	40	57	60	50	62	25	35	45	40	80	45	28	36	45
187	60	45	45	45	47	57	62	55	47	45	42	45	55	53	45
188	76	36	35	42	50	40	50	50	47	40	70	36	62	51	40
189	36	58	55	60	77	52	47	55	45	32	40	45	56	36	40
190	35	51	72	55	55	75	45	50	32	35	55	55	37	25	62
191	55	58	30	37	57	45	72	57	50	50	30	45	60	60	30
192	65	46	35	50	50	42	45	55	60	50	60	45	45	50	30
193	36	63	50	50	57	47	50	50	50	45	55	57	41	53	35
194	36	65	45	65	77	50	47	50	40	52	37	53	55	46	62
195	61	43	50	45	52	42	30	55	55	55	65	55	43	43	50
196	55	53	40	57	60	45	55	60	47	35	50	60	58	50	37
197	55	51	42	57	67	45	50	65	50	25	47	55	52	51	37
198	38	60	50	60	75	40	45	55	47	32	55	50	40	51	30
199	58	45	50	60	67	52	45	50	35	35	62	51	43	40	37
200	55	48	50	40	57	30	50	62	50	55	52	53	50	42	45
201	42	55	55	55	20	47	45	35	45	32	52	45	40	36	62
202	45	50	57	57	80	42	47	60	37	40	37	45	50	50	35
203	61	40	52	65	67	47	58	45	50	32	47	57	40	66	30
204	46	53	50	55	62	50	58	50	40	40	52	55	55	50	43
205	67	43	37	47	57	37	55	57	55	40	55	50	47	70	25
206	50	53	45	60	80	37	45	62	40	35	50	60	43	48	43
207	45	63	37	60	75	55	55	45	45	32	40	50	56	51	43
208	65	41	37	47	40	42	55	55	55	40	67	50	55	53	43
209	52	45	57	65	62	45	62	57	37	40	50	36	62	32	43
210	50	48	55	50	60	50	50	57	47	30	55	60	58	48	55
211	46	53	50	55	80	45	50	60	62	27	25	53	45	52	35
212	67	41	35	55	47	50	60	60	42	40	52	38	65	51	30
213	63	46	45	42	47	47	45	65	60	45	50	67	25	50	25
214	55	51	42	50	65	35	60	50	50	35	55	50	47	61	35
215	38	60	50	65	62	47	45	62	55	35	42	53	37	62	30
216	52	50	42	47	45	50	70	55	50	45	45	51	58	50	43
217	30	55	65	60	80	40	50	55	37	35	30	45	50	31	45
218	42	53	57	67	62	47	62	50	47	52	35	40	58	51	25

ATTRIBUTE SCORES

STU NUM	1	2	3	4	5	6	7	8 *	9 *	10	11	12	13	14	15	16	17 *	18 *	19 *	20	21 *	22	23 *	24	25 *
1	52	58	37	99	105	45	50	53	55	56	48	40	45	97	94	87	52	52	64	57	68	47	67	101	68
2	60	53	30	115	108	50	50	60	69	52	65	20	50	105	122	102	75	70	73	50	55	55	60	121	105
3	45	48	65	95	98	55	70	83	73	55	46	40	55	120	95	95	53	55	93	40	51	50	37	98	66
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65	61	33	65	103	[illegible]				[illegible]																

Legend on page 43.

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73	27	76	42	77	126	60	77	72	48	41	36	50	60	127	100	82	53	53	101	27	58	50	48	109	46
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77	40	48	70	110	118	70	72	75	63	60	45	55	70	142	105	67	53	70	86	27	48	70	45	122	50
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142	58	41	55	118	101	65	57	70	80	52	60	30	55	117	97	77	59	70	60	60	50	60	50	109	90
143	61	50	35	101	90	40	32	45	49	40	52	37	40	72	95	110	51	43	34	71	76	40	75	90	75
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145	65	48	30	125	108	55	45	53	76	56	65	30	55	105	125	105	78	75	64	47	56	60	67	123	95
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152	48	55	45	93	100	62	77	87	53	35	51	43	62	122	107	92	64	55	95	35	49	45	33	111	68
153	56	51	42	114	109	45	60	63	64	55	53	45	45	118	113	95	72	73	84	37	52	58	57	116	68
154	36	55	65	66	85	62	80	98	46	41	41	55	62	110	70	92	38	33	91	50	55	30	22	74	46
155	56	46	45	116	106	57	62	75	72	52	62	30	57	122	100	95	70	80	80	45	43	60	45	103	92
156	50	45	60	97	92	50	70	78	59	52	48	45	50	117	97	80	59	57	94	47	53	47	42	107	63
157	42	51	55	84	93	62	80	80	33	40	36	40	62	122	89	77	48	45	106	20	58	42	40	101	56
158	48	53	50	88	93	62	42	50	57	55	52	35	62	82	102	102	51	40	54	47	75	40	70	101	77
159	48	53	50	103	108	55	55	70	53	65	40	43	55	110	102	82	51	55	70	55	58	55	50	111	57
160	67	43	37	132	108	55	45	63	85	58	63	20	55	110	112	102	66	75	62	52	51	65	57	111	103
161	46	50	57	104	108	60	60	68	66	58	55	43	60	118	103	80	62	68	73	50	52	58	52	113	72
162	55	43	57	85	73	60	57	57	47	40	40	35	60	87	90	90	50	35	66	57	74	30	63	95	65
163	40	55	57	90	105	55	77	90	61	50	52	40	55	127	90	80	55	60	97	45	45	50	30	100	72
164	65	46	35	115	96	57	52	60	80	47	63	37	57	102	105	100	78	75	63	60	53	50	60	105	86
165	56	53	37	126	123	55	37	50	79	55	58	37	55	107	135	100	73	75	56	47	58	70	70	135	81
166	55	48	50	113	106	55	62	82	80	68	52	37	55	120	113	85	62	63	77	55	48	58	38	121	75
167	56	45	52	116	105	50	62	77	57	52	52	40	50	122	120	92	70	70	87	45	47	60	43	124	72
168	63	41	45	108	86	57	40	48	56	40	52	35	57	85	92	99	46	45	52	57	74	45	72	93	77
169	35	70	40	80	115	57	80	90	48	35	42	50	57	125	92	79	56	55	100	42	48	45	30	103	52
170	73	30	52	133	90	45	50	68	66	62	43	37	45	110	107	92	59	65	64	57	54	60	52	111	66
171	46	46	65	96	96	60	65	73	57	56	43	43	60	115	105	87	73	70	78	50	49	50	47	112	60
172	38	61	50	83	106	60	67	75	62	55	33	55	60	112	87	77	44	45	82	45	60	45	45	99	38
173	52	50	45	127	125	42	65	88	80	66	43	50	42	140	120	85	65	80	86	37	36	75	32	128	53
174	55	45	55	105	95	62	55	60	60	52	38	60	62	105	97	82	52	53	66	50	64	50	60	106	38
175	36	56	60	91	111	57	55	45	52	43	25	80	57	110	95	72	51	58	75	42	69	55	75	109	5
176	48	51	52	95	98	50	45	55	53	40	55	43	50	92	97	95	44	42	67	52	72	47	65	100	72
177	73	33	42	131	91	55	25	45	70	47	67	30	55	83	123	115	60	56	35	65	70	58	75	116	97
178	80	28	42	142	90	57	37	55	95	56	63	30	57	99	122	105	86	87	42	71	49	62	65	120	93
179	55	56	35	102	103	40	67	80	51	45	46	40	40	114	109	97	58	50	86	37	55	47	40	111	66
180	60	46	42	118	104	55	60	88	52	50	48	55	55	118	108	95	54	58	77	52	47	58	32	111	53
181	63	41	45	105	83	60	45	53	59	37	60	35	60	87	102	100	54	45	53	60	71	42	67	102	85
182	58	45	50	108	95	50	47	52	64	52	55	37	50	97	100	100	55	55	70	50	67	50	68	100	78
183	55	50	45	97	92	60	60	73	48	35	46	20	60	102	89	87	48	45	70	55	61	42	47	96	86
184	61	53	27	116	108	47	35	45	49	47	52	40	47	90	122	99	61	55	51	57	70	55	75	123	72
185	60	46	40	122	108	47	45	60	72	56	51	35	47	107	109	97	58	65	64	52	58	62	60	111	76
186	58	40	57	83	65	60	50	48	47	28	36	45	60	75	70	85	60	50	48	80	71	25	72	78	51
187	60	45	45	122	107	45	47	50	69	55	53	45	45	109	109	92	60	67	69	42	62	62	70	113	68
188	76	36	35	126	86	42	50	70	81	62	51	40	42	100	97	87	59	60	55	70	55	50	50	104	71
189	36	58	55	83	105	60	77	85	61	56	36	40	60	124	92	77	51	52	95	40	52	47	35	104	56
190	35	51	72	80	96	55	55	40	37	37	26	62	55	100	77	67	49	55	70	55	73	45	80	94	24
191	55	58	30	127	130	37	57	72	75	60	60	30	37	129	122	100	64	75	77	30	47	72	48	122	90
192	65	46	35	110	91	50	50	68	63	45	50	30	50	95	105	110	58	50	68	60	61	45	52	100	80
193	36	63	50	86	113	50	57	70	50	41	53	35	50	107	100	95	60	60	77	55	55	50	50	103	78
194	36	65	45	83	112	65	77	87	58	55	46	62	65	124	87	92	54	57	91	37	48	47	33	91	44
195	61	43	50	91	73	45	52	70	48	43	43	50	45	82	85	110	48	35	62	65	68	30	50	80	53
196	55	53	40	110	108	57	60	75	54	58	50	37	57	115	102	82	51	55	76	50	55	55	45	111	73
197	55	51	42	105	101	57	67	82	57	52	51	37	57	117	100	75	45	45	84	47	57	50	38	113	74
198	38	60	50	83	105	60	75	95	56	40	51	30	60	120	92	79	51	50	85	55	48	45	25	103	81
199	58	45	50	103	90	60	67	75	51	43	40	37	60	112	80	70	50	55	74	62	55	45	45	95	63
200	55	48	50	105	98	40	57	87	53	50	42	45	40	107	100	105	48	48	69	52	53	50	33	98	57
201	42	55	55	87	100	55	20	33	53	40	36	62	55	65	90	77	70	70	37	52	69	45	87	102	34
202	45	50	57	92	97	57	80	98	65	50	50	35	57	127	84	77	42	47	102	37	48	47	22	96	75

STU NUM	1	2	3	4	5	6	7	8 *	9 *	10	11	12	13	14	15	16	17 *	18 *	19 *	20	21 *	22	23 *	24	25 *
203	61	47	52	119	98	55	57	80	56	40	66	30	65	125	108	82	69	73	76	47	44	58	40	117	96
204	46	53	50	104	111	55	62	72	53	55	50	43	55	120	98	80	50	68	72	52	50	58	48	108	67
205	67	43	37	122	98	47	57	60	69	47	70	25	47	112	110	95	58	58	74	55	51	55	40	113	105
206	50	53	45	95	98	60	60	104	46	43	48	43	60	125	85	75	41	43	93	50	47	45	17	98	65
207	45	63	37	100	118	60	75	80	54	56	51	43	60	130	100	77	65	70	93	40	45	55	40	112	68
208	65	41	37	120	96	47	40	53	54	55	53	43	47	95	110	95	60	60	51	67	61	55	62	113	70
209	52	45	57	114	107	65	62	77	71	62	32	43	65	124	99	77	53	65	70	50	49	62	43	111	49
210	50	48	55	100	98	50	60	70	53	58	48	55	50	110	97	77	52	53	80	55	59	50	50	109	53
211	46	53	50	96	103	55	80	95	56	45	52	35	55	130	112	89	56	50	110	25	48	50	25	118	77
212	67	41	35	127	101	55	47	57	80	65	51	30	55	107	102	82	51	60	64	52	62	60	63	111	81
213	63	46	45	108	91	42	47	60	31	25	50	25	42	92	105	105	48	40	62	50	70	45	60	103	85
214	55	51	42	115	111	50	65	90	64	47	61	35	50	125	110	85	65	70	85	55	40	60	30	118	86
215	38	60	50	83	105	65	62	75	57	37	62	30	65	107	100	90	48	43	74	42	61	45	45	105	92
216	52	50	42	122	120	47	45	55	63	58	50	43	47	115	120	95	65	75	67	45	55	70	65	123	67
217	30	55	65	80	105	60	80	100	56	50	31	45	60	130	87	72	49	55	103	30	43	50	20	101	46
218	42	53	57	104	115	67	62	75	75	58	51	25	67	124	109	99	65	72	75	35	47	62	45	110	86

LEGEND

STU NUM -- Student Number.

Numerical COLUMN HEADINGS (1-25) -- Numbers are keyed to the SORT Attribute numbers found in SORT ATTRIBUTE DESCRIPTIONS, pp. 49-53.

* -- Indicates those Attribute scores where a constant, 60, has been added to the true SORT score. See notes in SORT ATTRIBUTE DESCRIPTIONS, p. 49, for explanation.

```
      PROGRAM REGRESS1
      DIMENSION Y(15,218),IY(25,218),IY(25,218)
      L=218
      READ 10,((Y(I,J),I=1,15),J=1,L)
   10 FORMAT(14X,15F3.0)
      PRINT 50
   50 FORMAT(1H1//)
   12 DO 17 J=1,L
      IY(1,J)=Y(1,J)
      IY(2,J)=Y(2,J)
      IY(3,J)=Y(3,J)
      IY(4,J)=Y(1,J)+Y(7,J)
      IY(5,J)=Y(2,J)+Y(7,J)
      IY(6,J)=Y(4,J)
      IY(7,J)=Y(5,J)
      IY(8,J)=Y(5,J)-Y(6,J)+60
      IY(9,J)=((Y(14,J)+Y(13,J))/2.-(Y(12,J))+60.
      IY(10,J)=Y(13,J)
      IY(11,J)=Y(14,J)
      IY(12,J)=Y(15,J)
      IY(13,J)=Y(4,J)
      IY(14,J)=Y(5,J)+Y(7,J)
      IY(15,J)=Y(9,J)+Y(7,J)
      IY(16,J)=Y(10,J)+Y(9,J)
      IY(17,J)=((Y(9,J)+Y(7,J))/2.)-Y(8,J)+60.
      IY(18,J)=Y(7,J)-Y(8,J)+60.
      IF(Y(4,J)-50.)13,14,15
   13 SEQ=125.-(Y(4,J)*2.)
      GO TO 16
   14 SEQ=25.
      GO TO 16
   15 SEQ=(Y(4,J)*2.)-75.
   16 IY(19,J)=Y(5,J)-((SEQ+Y(11,J))/2.)+60.
      IY(20,J)=Y(11,J)
      IY(21,J)=((Y(8,J)+Y(6,J))/2.)-(Y(5,J)+Y(7,J))/2.+60.
      IY(22,J)=Y(7,J)
      IY(23,J)=Y(6,J)-Y(5,J)+60.
      CFEQ=100.-Y(10,J)
      IY(24,J)=((CFEQ+Y(9,J))/2.)+Y(7,J)
   17 IY(25,J)=Y(14,J)-Y(15,J)+60.
      DO 20 I=1,25
      DO 20 J=1,L
   20 IY(I,J)=IY(I,J)+.5
   18 PRINT 19,((IY(I,J),I=1,25),J=1,L)
   19 FORMAT(1H0,3X,3I2,2I3,2I2,2I3,4I2,6I3,1I2,1I3,1I2,3I3)
      END
      END
```

SEE ATTRIBUTE SCORE DEFINITIONS IN DEFINITIONS OF KEY TERMS SECTION FOR EXPLANATION OF ADDITION OF CONSTANT, 60, TO EIGHT OF THESE FORMULAE.

Note: Following is a sample input data card for Student #83:

0831511100070038.0 .37. 5. 2.47. 4.55.42.40.37.53.50.43.45.

Columns 11-69 are the 15 Variable scores.

SORT VARIABLE DESCRIPTIONS
(14, p. 3)

Number	Symbol	Description
1	W	Whole-blot responses
2	D	Major blot-details
3	Dd	Minor blot-details
4	S	White-space responses
5	F	Responses closely resembling the form of the stimulus.
6	F-	Responses poorly resembling the form of the stimulus.
7	M	Responses involving human movement or posture-tension.
8	FM	Responses involving animal movement or posture-tension.
9	FC	Responses involving color and closely resembling the form of the stimulus.
10	CF	Responses involving color and poorly resembling the form of the stimulus.
11	Fch	Responses involving textural density of gray or shading.
12	A	Responses involving whole animals or parts of animals.
13	H	Responses involving total human figure or parts of humans.
14	P	Modal responses (Statistically derived)
15	O	Rare responses (Statistically derived)

SORT ATTRIBUTE DESCRIPTIONS

Notes: (1) From the SORT Manual (14, p. 15-16)

(2) Each description is accompanied by a formula for calculating the attribute as a function of the SORT Variables.

(3) Those marked with an asterisk (*) indicate that a constant, 60, has been added to the formula to render the results positive. For true SORT Attribute scores, subtract 60.

1. Theoretical: Facility for thinking in broad, general or abstract terms; facility for getting perspective, visualizing the overall picture, and seeing relationships between the parts. W

2. Practical: Tendency for thinking or attacking problems on the basis of practical, concrete, or very definite details. D

3. Pedantic: Preference for thinking and attacking problems from the standpoint of fine, minute details; tendency to be perfectionistic and to focus on precise, sometimes trivial details. Dd

4. Induction: Facility for logical thinking based upon inferences from elements; utilization of their accumulative synthesis to lead to conclusions, principles, or generalizations; ability to organize details into a meaningful whole. W + M

5. Deduction: Readiness to employ the logical approach in which established or speculative theories, principles, or generalizations are applied to data or details for the purpose of analysing their relationships to one another (and to the principle probably involved). A balance between facilities

for inductive and deductive thinking, especially when both are high, would point toward a mental adaptiveness or "efficiency" wherein such intellectual potential as the individual has is the more effective because of versatility in logical processes. D + M

6. Rigidity: Tendency toward the dogmatic or toward fixed ideas. Higher scores suggest an unwillingness to change a point of view in spite of evidence to the contrary; low scores suggest an uncritical acceptance of others' viewpoints. S

7. Structuring: Facility for mental alertness and precision and exactitude in perception of reality. Occasionally this relates to a somewhat rigid and formalistic way of solving problems, but usually indicates an awareness of and conformity to the environment and its demands. F

* 8. Concentration: Capacity for attending to the task at hand or for avoiding distractions from one's environment or from one's own extraneous thoughts. F-FNeg + 60

* 9. Range: Tendency of interests to be either expansive or to be narrow and confined. $\frac{P+H}{2}$ - A + 60

10. Human Relationships: Disposition toward the perception of and attention to elements having human connotations. H

11. Popular: Tendency to perceive the same features in the same way as others; to see things as other persons do; empathic tendencies. P

12. Original: Disposition to perceive the unique, the different, and the non-conforming, perhaps even the eccentric; emphasis on individualism of actions. O

13. Persistence: The determination not to deviate from a set course. It may appear as doggedness or stick-to-itiveness. It can range from inability to stick to or complete a task along to the further extreme of stubbornness, defiance, or contentiousness. S

14. Aggressiveness: The aspiration toward goals by means of well-accepted and morally developed procedures; willingness and desire to work; sense of a mature self-control with social conformity. F + M

15. Social Responsibility: Willingness to subserve oneself, even though no personal gains are evident; energetic acceptance of one's obligations to himself, to his family, and to society. FC + M

16. Cooperation: Willingness to use a teamwork approach; sensitivity toward others in combination with appreciation and responsiveness in human relationships. Willingness to submerge one's immediate needs to the long-range interests of other persons is implied. CF + FC

* 17. Tact: Control of impulses and biases; maturity expressed in the ability to maintain stable relationship with superiors, peers, and inferiors. There is balance between inner impulses, conscious self-control, and demands of the social environment. $\frac{FC+M}{2}$ - M+60

* 18. Confidence: Ego-strength, self-confidence, morale; inner feelings of prestige or personal worth, ranging from feelings of inferiority to strong feelings of self-assurance.

It implies ability to withstand stresses and strains and to maintain feelings of self-worth (prestige) in the face of adversity. M-FM+60

* 19. Consistency of Behavior: Predictability of actions; tendency for characteristic behavior patterns to be stable and well established. $F- \frac{SEQ+Fch}{2} + 60$

20. Anxiety: Generalized apprehensiveness, uneasiness, or internal disquietude; self-concern and preoccupation with personal well-being, feelings, emotions, and sensations, resulting from a feeling of insecurity. A low anxiety score indicates composure; however, excessive composure, or almost complete absence of anxiety, may indicate a tendency to smother feelings to the point of seeming cold and insensitive. Anxiety may reflect itself in feelings of insecurity, expressions of inadequacy, or constriction of behavior; it may also reflect itself in erratic behavior. Fch

* 21. Moodiness: Sharp fluctuations in mood, ranging from elation to depression. The intensity and duration of either phase may vary greatly. $\frac{FM+FNeg}{2} - \frac{F+M}{2} + 60$

22. Activity Potential: Control of emotional energy; energy endowment; capacity to follow through on a planned course of action; concentration of energies in a given direction, as opposed to dissipation of strength in non-productive channels. M

* 23. Impulsiveness: Tendency to act upon impulse rather than on a basis of a considered plan; reflected in spur-of-the-moment decisions. FNeg - F + 60

24. Flexibility: Adaptability; faculty for accepting and handling most life situations in a mature manner; capacity to adjust readily from one type of situation to another.

$$\frac{CFEQ + FC}{2} + M$$

* 25. Conformity: Tendency to accept and be directed by the socially accepted codes, customs, mores. P - 0 + 60

FNeg: F-

CFEQ: CF Equivalent (See ABAC Tables)

SEQ: S Equivalent (See ABAC Tables)

GROUP MEANS

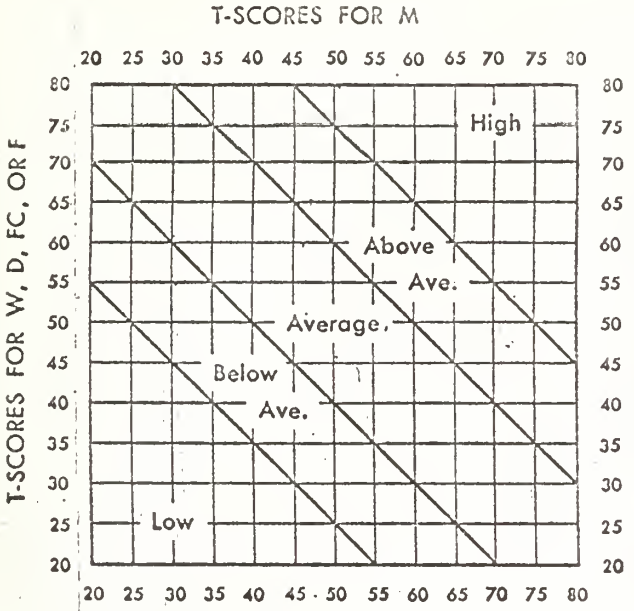
Following are the group means and standard deviations for this 218 person subject group for the variables used in this study. In the case of the SORT Variables, a comparison is made with the scores for Industrial Supervisors (14, p.7), intuitively chosen as the civilian group most closely comparable with the subjects in this study. Comparative means for the Attributes are not available. The constant, 60, has been subtracted from the Attributes to which it was added earlier. This permits entry to the ABAC Tables (rear of Appendix) for calculation of ratings.

	T- SCORE GROUP MEANS		
VARIABLE	Ind. Super.	Study Grp.	Study Group STD. DEVIATIONS
1. W	58.0	51.7	10.5
2. D	48.1	49.6	8.1
3. Dd	41.1	49.0	9.7
4. S	52.5	53.5	9.7
5. F	60.5	57.8	8.1
6. F-	46.1	49.0	12.7
7. M	50.5	52.2	7.0
8. FM	55.4	53.4	10.6
9. FC	46.1	50.0	8.0
10. CF	32.5	40.6	8.0
11. Fch	42.0	48.3	8.2
12. A	45.5	49.9	9.6
13. H	31.1	50.5	9.6
14. P	50.9	48.6	9.6
15. O	35.9	39.5	9.0
COMM. SERV.		10.6	3.9
ENL. SERV.		2.4	3.3
AGE		34.3	3.9
LONGEVITY		13.1	4.9

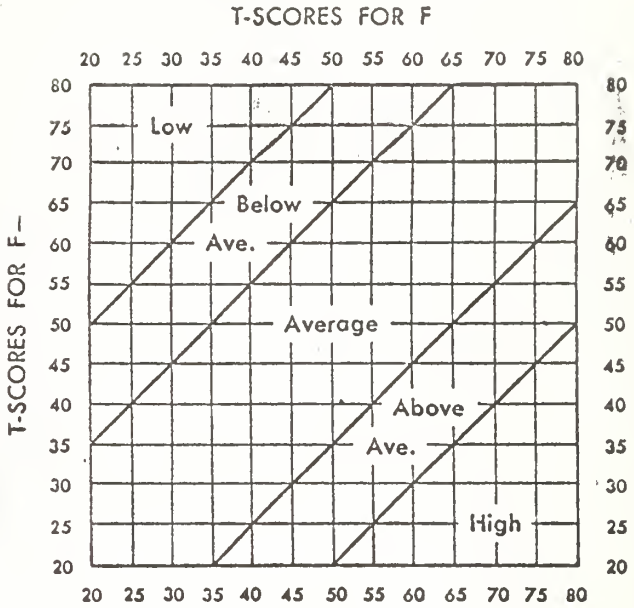
GROUP MEANS (CONTINUED)

ATTRIBUTE	MEAN	STD. DEV.	RATING
1. Theoretical	51.74	10.52	Average
2. Practical	49.64	8.04	Average
3. Pedantic	48.98	9.74	Average
4. Induction	103.95	16.98	Average
5. Deduction	101.85	11.83	Average
6. Rigidity	53.48	8.05	Average
7. Structuring	57.84	12.66	Above Av.
8. Concentration	8.88	14.68	Average
9. Range	-1.92	14.49	Average
10. Human Rel.	50.54	9.63	Average
11. Popular	48.63	9.03	Average
12. Original	39.55	10.18	Below Av.
13. Persistence	53.48	8.05	Average
14. Aggressiveness	110.06	13.86	Above Av.
15. Social Resp.	102.19	12.29	Average
16. Cooperation	90.56	10.51	Average
17. Tact	-3.87	10.00	Average
18. Confidence	-2.76	12.82	Average
19. Consistence	14.24	12.48	Above Av.
20. Anxiety	48.32	9.58	Average
21. Moodiness	-4.42	8.95	Average
22. Activity Potential	52.21	10.59	Average
23. Impulsiveness	-9.12	14.67	Average
24. Flexibility	107.17	11.54	Average
25. Conformity	9.08	17.66	Above Av.

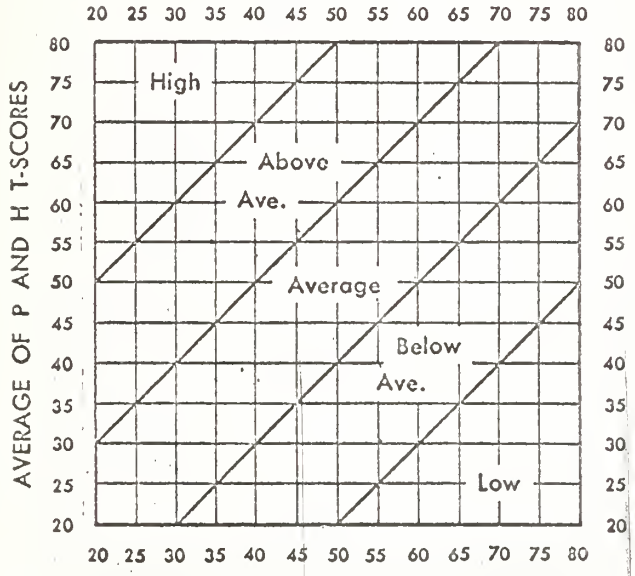
ABAC 1
RATINGS FOR INDUCTION (W:M),
DEDUCTION (D:M), SOCIAL RESPONSIBILITY (FC:M)
AND AGGRESSIVENESS (F:M)



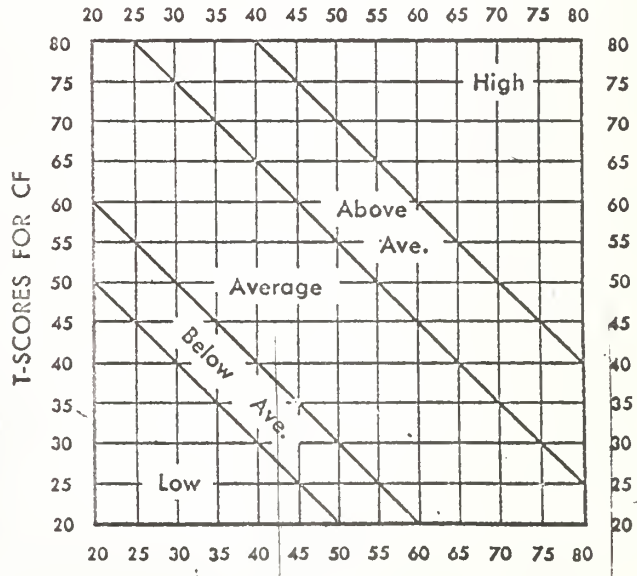
ABAC 2
RATING FOR CONCENTRATION (F—:F)



ABAC 3
RATING FOR RANGE OF INTERESTS (P:H::A)

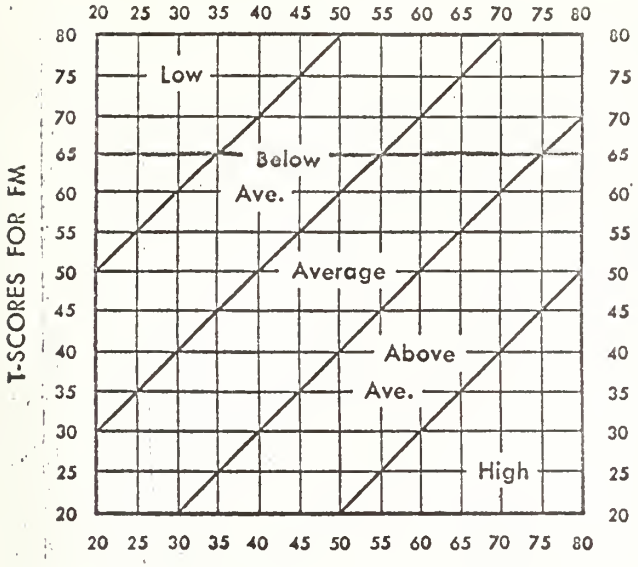


ABAC 4
RATING FOR COOPERATION (CF:FC)

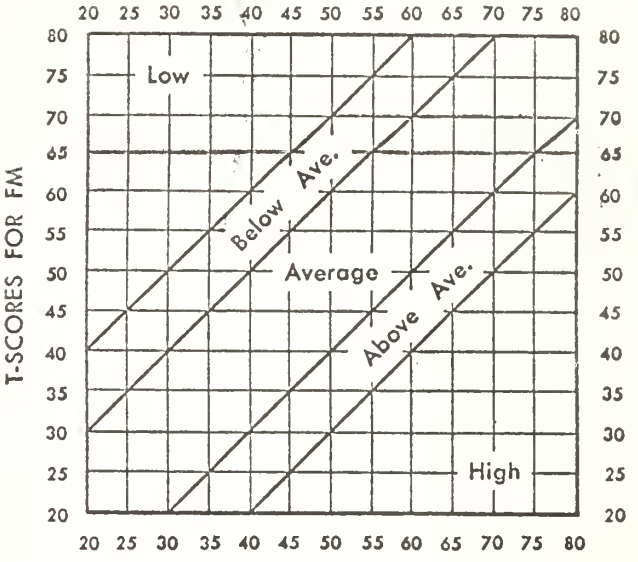


NOTE: These tables are for use in calculating SORT Historical Norm RATINGS of Attributes, using SORT Variable scores to enter tables. (14, p. 25-27)

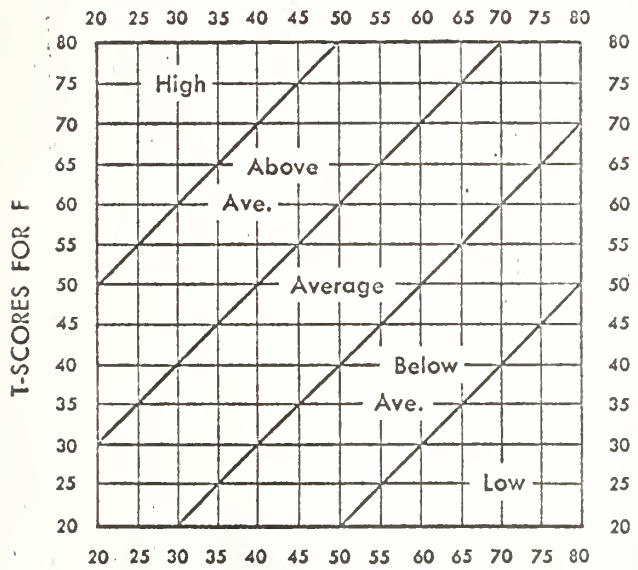
ABAC 5
RATING FOR TACT (FM::FC:M)



ABAC 6
RATING FOR CONFIDENCE (FM:M)



ABAC 7
RATING FOR CONSISTENCY (F::S:Fch)



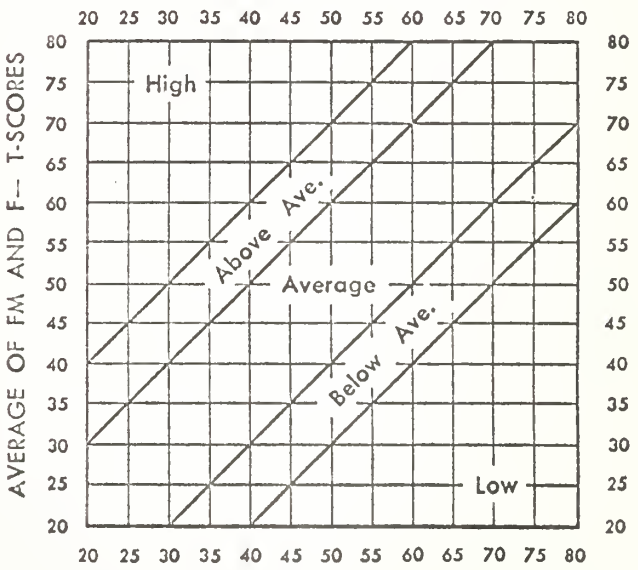
*T-SCORE FOR S EQUIVALENT

25	75
35	55
45	35
50	25

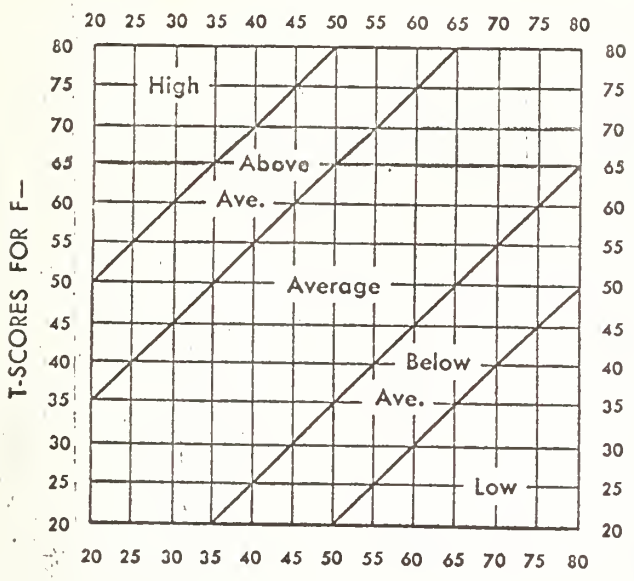
T-SCORE FOR S EQUIVALENT

55	35
65	55
75	75

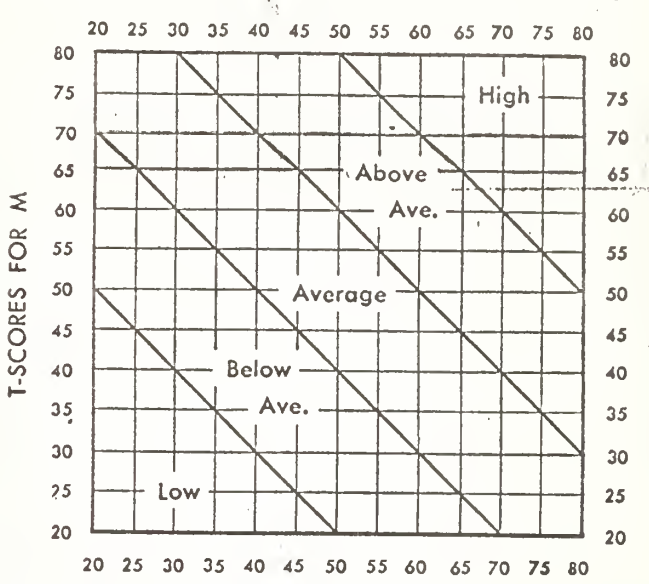
ABAC 8
RATING FOR MOODINESS (FM:F— ::F:M)



ABAC 9
RATING FOR IMPULSIVENESS (F—:F)



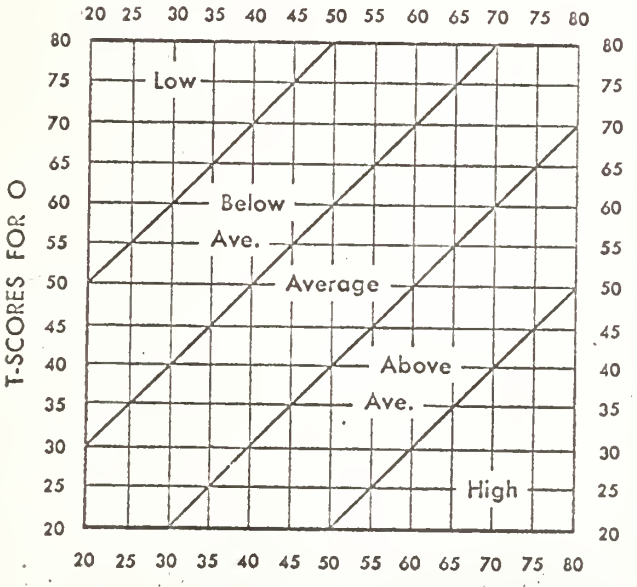
ABAC 10
RATING FOR FLEXIBILITY (M::CF:FC)



*T-SCORES

FOR CF	EQUIVALENT
25	75
35	65
45	55
50	50
55	45
65	35
75	25

ABAC 11
RATING FOR CONFORMITY (O:P)



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